DOCUMENT RESUME

ED 057 634 24 EM 009 509

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TITLE Teaching Slow Readers Using the Electric Typewriter. Final Report.
INSTITUTION California State Polytechnic Coll., Pomona. Kellogg-Voorhis Campus.
SPONS AGENCY Office of Education (DHEW), Washington, D.C. Bureau of Research.
BUREAU NO BR-1-I-079
PUB DATE Aug 71
CONTRACT OEC-9-71-0048(057)
NOTE 68p.

EDRS PRICE MF-$0.65 HC-$3.29
DESCRIPTORS *Behavior Change; Educational Technology; Motivation; Positive Reinforcement; Reading Difficulty; Reading Improvement; *Reading Instruction; *Remedial Reading Programs; *Typewriting

ABSTRACT

The hypothesis that first and second graders can improve reading skills by learning to type on electric typewriters was tested in this study. Other purposes of the research were to develop linguistic comprehension in Standard English, to produce introductory reading materials which promote phonic understanding as they fix typing-key strokes, and to use pattern practice and key-stroking exercises to develop finger dexterity and rhythm. Subjects, 15 children identified as having difficulty in learning to read, participated in the eight-week program for two hours daily, five days a week. The mean class gain of .96 of a grade level on the Survey of Primary Reading Development indicates that a significant amount of reading improvement takes place as a child learns touch typing. Other results suggest that the children showed progress in vocabulary development and linguistic comprehension, a mastery of the alphabet and the correct phonic associations, and development of good finger dexterity. Uncontrolled variables such as low teacher-pupil ratio and Hawthorne effect might have favored reading improvement, although there were a host of uncontrolled negative variables which as easily could have been unfavorable to improvement. (Author/SH)

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TEACHING SLOW READERS USING THE ELECTRIC TYPEWRITER

August 1971

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Office of Education

Regional Research Program, Region IX, San Francisco, California

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August 28, 1971

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U.S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE

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Regional Research Program, Region IX, San Francisco, California

AUTHOR'S ABSTRACT

First and second graders can improve reading skills by learning to type on electric typewriters. In a research project conducted at Cal Poly, Pomona, in July and August, 1971, 25 children were given instruction on Selectric typewriters. Fifteen children completed the 8-week program. The mean grade level improvement in reading was .96.

The class met for 2 hours, 5 days a week. Four experienced teachers worked with the children, in groups of 5 or 6, rotating through the groups on succeeding days. Practice material which presented the home row keys and the reaches to the other keys was developed specifically for this program. All practice material was prepared on a primary typewriter with double spacing. Short vowel sounds and monosyllabic words were used until the entire keyboard had been presented. "Sight" words, words for which the phonetic representation is not in a 1:1 ratio with the graphic representation, were held to a minimum during the keyboard presentation phase of the instruction. After the students had learned the entire keyboard, long vowel sounds and polysyllabic words were introduced gradually.

Once the keyboard had been learned by the student, he was given second- or third-grade level stories for practice material. The children read the stories to the teacher after they had typed them. Other than this reading practice, there was no overt reading instruction.

These children were never aware that this program was a "reading" program. It was assumed that these children who were having difficulty learning to read had been turned off by most standard approaches to learning to read.

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INTRODUCTION

The Selectric typewriter is used in this research program to teach first- and second-grade, Title I, children reading. Twenty-five children from the Azusa Unified School District were chosen by their teachers for this program on the basis of their having difficulty learning to read. Assuming that the children had been turned off by standard approaches to learning to read, the program was billed as a class in which they were learning to type by touch, which, in fact, they were. Fifteen children completed the program.

The normal expected gain in reading is one grade level for each 36 weeks of instruction. The children in this reading program were not making normal progress in reading skills. This was the basis on which they were chosen. The mean reading gain for the 15 children who completed the program was .96 grade level. In the same period of time in a regular classroom one would expect 8/36 of a grade level, or .225.

There are, of course, a number of uncontrolled variables. The pupil-teacher ratio was one to six in the beginning of the program and about one to five at the end of the program. (As attendance decreased, one teacher was freed from teaching duties to conduct testing and to video-tape the sessions.) There was the excitement of "going to college." There was no doubt some Hawthorne effect from being in a special program and from the increased amount of attention of a reduced teacher-pupil ratio. These are all positive aspects of the program.

Some negative aspects must also have influenced results. The children were in class only two hours a day - including the break - as

opposed to a full-day's instruction in a regular program. The third week of the program one boy brought the mumps; from that first case, the program suffered rather prolonged absences of one child after another to the end of the program. Attendance at summer sessions suffers in competition with vacations, swimming pools, Disneyland trips, etc.

Considering uncontrolled variables, both positive and negative, the results still seem significant. For children, who are making less than normal progress in learning to read, to make almost one full grade level of improvement in 8 weeks of instruction is significant.

This research program indicates that slow and even non-readers can be taught reading skills as a by-product of learning touch typing.

The researcher believes that even greater gains can be made if direct approaches to teaching reading are incorporated in a touch-typewriting program.

Material for presentation of the home row and keyboard reaches was developed specifically for this program. Monosyllabic words with a 1:1 ratio between graphic representation and phonic realization were used throughout the keyboard presentation stage. "Sight" words, or words that cannot be sounded out, were held to a minimum, especially in the keyboard presentation stage. Words, rather than nonsense practice patterns, were used as much as possible. Long vowel sounds and polysyllabic words were not presented until the entire keyboard had been covered.

After the students had completed the practice material specifically designed for this research program (for an example, see Appendix A, page 42), they were given material to type from second- and third-

grade readers.[1] The material taken from the readers was typed on a primary typewriter for the children's practice material.

Initially, some children had difficulty operating their fingers independently to activate the keys - particularly the ring finger and the "pinky." However, all children, with practice, developed adequate finger dexterity to master typing by touch.

Seventeen of the original 25 children were boys. Boys seem to be fascinated by machinery. This program exploits this natural male interest. The children were a little apprehensive when they first entered the "college classroom." However, by the third or fourth day they were relaxed and enthusiasm remained high throughout the program.

Four teachers worked with these children in groups of six, which after attrition, became groups of four. Each teacher worked with a different group on succeeding days.

The primary researcher is an experienced typewriting teacher. One teacher is a remedial reading specialist in the Cal Poly Teacher Preparation Center. A third teacher is a primary consultant with Title I children in the Pomona Unified School District. The fourth teacher worked with sixth-grade Title I children and is a remedial reading specialist.

Review of the Literature. A fairly comprehensive search of the literature reveals nothing in the area of teaching slow- and non-readers at the primary level using the electric typewriter.

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[1] NEW READING SKILL BUILDER; Grade Level II, Parts 1, 2, and 3; Grade Level III, Parts 1, 2, and 3; 1966; Pleasantville, N. Y.: Reader's Digest Services.

Stone and Burton, NEW PRACTICE READERS, Book A; 1960; St. Louis, Missouri: Webster Division, McGraw-Hill Book Company.

Grover and Anderson, NEW PRACTICE READERS, Book B; 1960, St. Louis, Missouri: Webster Division, McGraw-Hill Book Company.

Typewriters, usually manual typewriters, have been used in a number of elementary classrooms. Primary children do not have the finger strength to manipulate a manual typewriter. Only electric typewriters, preferably Selectric typewriters, so the child cannot jam the keys, should be used.

Allowing a child to "play" with the typewriter can do no harm. However, a child will soon begin to lose interest in the typewriter. A carefully structured program for teaching him touch typewriting can retain his interest for a long period of time. As a child masters the keyboard and begins to type stories, he becomes interested in building his typing skill - increased words per minute and fewer errors. Unstructured play with a typewriter cannot sustain a child's interest.

O. K. Mcore, formerly of Yale University and now with the University of Pittsburgh, has done extensive work with the electric typewriter in his "Responsive Environments Corporation" and a Head Start teaching model. However, this work involves using computer-assisted instruction, which is too expensive for general use in most school districts.

Dr. Lawrence Erickson, UCLA, the principal researcher's advisor in her doctoral program, published Typing Our Language[1], Scott, Foresman, 1970, for grade level 5 and above.

The researcher worked with Claremont Public Schools and IBM, who furnished 12 typewriters at no charge to Mountain View Elementary School, to establish, in September, 1970, a program to teach educationally handicapped children using the Selectric typewriter.

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[1]Lawrence W. Erickson, TYPING OUR LANGUAGE, Glenview, Illinois: Scott, Foresman and Company, 1970.

Edward Fry wrote Typing Course for Children[1]. This book is designed to teach the "traditional touch system" with minimal teacher or parent supervision to children ages 9 through 12. This text is not designed for children on the primary level, much less those with reading problems.

Jack Yuen in "Methodology for Elementary School Typewriting"[2] reviews the research on using typewriters in the elementary grades. In summary, the relevant studies conclude that the typewriter can be helpful in language skills in the elementary grade. However, no attempt was made to teach primary children to type by touch. Teaching touch-method typing to primary children, particularly those with reading problems, seems to be the unique feature of this USOE-funded study.

Need for Further Research. Although the children made significant gains in reading skills in a program that focused almost entirely on teaching typewriting, it appears that provisions should be made for including more direct approaches to teaching reading.

Before children can master touch typing, they should know the letters of the alphabet. The typewriter can be used to teach children the letters of the alphabet, and this was effectively done in the program; but children needing this kind of attention should be handled in a group separate from those who are ready to learn touch typewriting. A pre-test can be developed using the typewriter to determine whether or not a child has mastered the alphabet. Also the WRAT can be used as a pre-test. In addition, children must be able to work in a small-group situation to learn to type in a program of this design.

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[1]Edward Fry, TYPING COURSE FOR CHILDREN, Highland Park, New Jersey: Dreier Educational Systems, 1969.

[2]Jack Yuen, "Methodology for Elementary School Typewriting," EASTERN BUSINESS TEACHERS ASSOCIATION YEARBOOK, 1965, Volume 38, Somerset, New Jersey: Somerset Press, 1965, pp. 116-130.

Plans are being made now to use the material developed in this program and the information gained from this experience to design a program to handle all the learning problems of slow readers and non-readers.

METHODS AND PROCEDURES

Description of the Population. Azusa Unified School District identified 25 first- and second-grade children, former Head Starters, who were having difficulty learning to read. Seventeen of the children were boys; seventeen had Spanish surnames; and two were Black.

Description of the Staff. The primary researcher, Mrs. Katherine Seibert, is an Associate Professor in the School of Business Administration, Cal Poly, Pomona. Mrs. Seibert also served as one of the teachers. The behavior modification consultant, Dr. Ray Garris, was a lecturer in the Teacher Preparation Center at Cal Poly, Pomona, and is now Head of the Department of Special Education and Rehabilitation at the University of Pittsburgh. The reading consultant, Mrs. Jane McGraw, who also served as one of the regular teachers, is a lecturer in the Teacher Preparation Center, Cal Poly, Pomona. Mrs. Lois Wood, one of the teachers in the program, is a primary teacher and consultant at James Madison School (a Title I school), Pomona Unified School District. The fourth teacher, Miss Elizabeth Anderson, is a sixth-grade teacher and remedial reading instructor at Slauson Intermediate School, Azusa, working primarily with Title I children.

Description of the Classroom. A college typing classroom, Business Building, Room 204, Cal Poly, Pomona, was used throughout the program. Most of the typewriters (19) were IBM Selectrics; in addition, 8 SCM 250's were used before attrition reduced class size. The chairs were posture chairs, adjusted for college-sized students. Reams of paper were used to elevate the children to proper height for typing. Their

feet never touched the ground. Desks were placed end to end, touching the wall at each side, and with only one aisle down the center of the room. One teacher worked with four or five students from the center aisle to the wall.

A lighted, programmable keyboard chart (see Appendix, page 43) hung from the top of the board in the front of the room. This board was colored in eight different colors, to correspond with the eight fingers used to strike keys. The children colored their fingernails to correspond with the coloring of this lighted chart. Also, a sheet of paper containing the same lettered chart (see Appendix, page 45) was given to each child, for the first three consecutive days of attendance, and the child colored the schematic to correspond with the lighted chart and his fingernails. This is an extremely helpful procedure for fixing home-row position of the fingers. Children should be assisted in this procedure, but the actual process should be performed by the child.

IBM Selectric typewriters are recommended for teaching primary children typing. Electric typewriters are essential because primary children do not have sufficient strength and finger dexterity for typing on a manual typewriter. The Selectric typewriter does not have a carriage that moves, or hinged keys to clash at the point of impact when keys are struck at the same time or in too-close succession. Impressions are made by an element that moves across the page. If two keys are struck at the same time, only one is printed; or, if two keys are struck in very close succession (which is generally the case), the first is printed immediately followed by the second. The typewriter

holds the second and releases it after the first is printed. The teacher does not have to spend time untangling the keys. Additionally, the Selectric machine was able to take the punishment dished out to it in this program with no downtime for maintenance.

Carefully structured and monitored behavior modification techniques were implemented during the 5th week. Before that time, a separate classroom was used by one of the staff members to work with the children who were having difficulty learning the keyboard. These children were given language activities designed to teach the alphabet and corresponding phonic realizations. These children received about 30 minutes of 1:1 instruction from the staff on learning the keyboard. Three of these children were eliminated from the program at the end of the fifth week because they were unable to work in a small group (1:4) situation. A fourth child was dropped at the end of the second week because he left the bus, went through the building, and never came to class.

Staff Meeting. From 4 to 5 p.m. each day - sometimes less, but often longer - the instructors and consultants met to discuss procedures, results and modifications. Anecdotal records were kept daily on each child by the teacher who worked with him that day. Teachers rotated through the groups taking a different group each day.

During staff meetings, video tapes of that day's activities were used to illustrate attentional behavior and interfering behavior. Instructors were reinforced for good procedure as demonstrated by the video tape and the results plotted on the behavior modification chart. A large chart was placed on the board in the back of the room and the observers charted each day's results on the chart at the end of the

day. This chart was used in staff meetings to evaluate daily progress and overall accomplishment.

A daily journal was kept by the primary researcher and circulated the following day to the staff members.

Teaching Materials and Devices. Drill materials for presenting the home-row keys and the various reaches were developed for this program (see Appendix, page 42). Short vowel sounds only are presented until the entire keyboard is covered. Monosyllabic words that follow standard phonic representations, 1:1, symbol for sound, are used in the first 18 pages. The final page of drill material, page 19, introduces simple polysyllabic words. Initial and final consonant blends are held to a minimum, and no word has both until the entire alphabet (keyboard) has been presented.

Shift Key. The teaching of the shift key to make capital letters was delayed until all the letter keys had been covered. This is a difficult manipulation for small children. The right shift key was presented on page 10 and the left shift key presented on page 11. Obviously, no textual material of any length was presented until these two pages were completed. One elementary typing text[1] avoided this issue by having the children work in lock shift for a considerable period of time in the initial stages of learning touch typewriting. Some of these children discovered the lock-shift key and worked in all caps at times. But this was generally discouraged by the instructors. The print form on the typewriter keyboard is in capital form, and the

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[1]Edward Fry, TYPING COURSE FOR CHILDREN, Highland Park, New Jersey: Dreier Educational Systems, 1969.

printout on the paper as a result of striking that key is in lower case. Repetition of the observation of these relationships, which is a natural concomitant of learning touch typewriting, provides mastery learning.

Children were encouraged to read regularly from the material they had typed. If they found a mistake in the copy in their machines, they were encouraged to use the backspace key and strike over. Children were also taught to use the (X) key and the (/) to scratch out incorrect or unwanted material in their typewritten copy. The goals in this program are certainly not the same as those for a vocational typewriting class. The fact that a child could read the material he had typed and know that it was incorrect was a valuable learning experience. Children were encouraged to become aware of their own mistakes and make corrections in some form.

"Sight" words (look-say words), or words that cannot be sounded out, are spaced out in the presentation - none on the first page, two on pages 3, 4, and 5, and one on page 6. The number of sight words per page increases very gradually from page 7 through page 19.

Presentation of the home row and reaches for the letters "h" and "i" are presented on page 1 (see Appendix, page 42). Subsequent pages present reaches to the upper row, followed by reaches to the lower row. Index and middle-finger reaches precede ring-finger and "pinkie" reaches.

Long vowel sounds are begun on page 14. The entire keyboard is covered when page 13 is completed.

The sounds of q, x, y, and z are delayed because they are phonically more difficult for the child. The soft sounds of "c" and "g" are

delayed to alleviate the interference caused by the hard sounds of these same letters. Number and symbol keys are never presented. When students need to use numbers in contextual material, they are encouraged to look and use the "proper" finger (which is color coded on the overhead keyboard chart).

The class met 5 days a week, from 2 to 4 p.m., in the Business Building, Room 204, Cal Poly, Pomona, from July 2 through August 27, 1971. The children were usually working well by 2:05, a 15- to 20-minute break occurred at 3 p.m., and the second period lasted until 3:50 p.m. Each teacher worked with a group of 5 or 6 students, rotating through the 4 groups so that she contacted each student once every 4 days. The final 10-minute period was spent checking in the student's work and materials, awarding "pokies" for completed work and getting ready to leave.

No IQ scores were requested from Azusa Unified School District. All instructors indicated they were interested (and even eager) to work without knowledge of the students' IQ scores.

The students were informed that the class was a typewriting class, as indeed it was. The instructors were asked to consider the program as a typing program and to emphasize "touch typewriting" as the goal. A basic assumption was that these children had been "turned off" by standard approaches to learning to read.

The boys were particularly interested in the machinery and gadgetry of the typewriter. They were encouraged to investigate within certain limits; that is, they could investigate but could not lift the front cover of the machine. Also, they never discovered that the element is

removable. This mechanical interest on the part of the boys held steady throughout the program. After they learned the keyboard, they were interested in developing greater skill and speed in touch typewriting.

Teachers were encouraged to read materials with students as they worked and to discuss words. Students read completed drill pages (starting with the paragraph material on page 15) and stories after having typed them and before they were given the next assigned material.

Contextual practice materials (stories) were typed on the primary typewriter from second- and third-grade reading material of NEW READING SKILL BUILDER and NEW PRACTICE READERS.[1] (see Appendix, page 46).

Students in this program progressed at their individual paces from the first day of class. Goals and objectives for the entire group were the same - to develop skill in touch typewriting and thereby improve their reading skills (although the children were not aware of the latter goal). Methods of instruction to attain these goals were highly individualized. It was assumed that each teacher had her own "teaching style" just as each child had his own "learning style."

Behavior modification principles were employed to motivate the children. In staff meetings, the behavior modification consultant and the primary researcher "reinforced" teachers for "catching the children displaying typing behavior" and reinforcing them verbally and with "pokies."

The children had a one-hour bus ride each way and were encouraged to go to the restrooms before beginning typewriting. Two simple rules

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[1]NEW READING SKILL BUILDER; Grade Level II, Parts 1, 2 and 3; Grade Level III, Parts 1, 2 and 3; 1966; Pleasantville, N.Y.: Readers Digest Services.

Stone and Burton, NEW PRACTICE READERS, Book A; Grover and Anderson, NEW PRACTICE READERS, Book B, 1970, St. Louis, Missouri: Webster Division, McGraw-Hill Book Company.

were given the children: (1) Go to the restrooms before class and at break, and (2) Raise your hand for help and for new practice material. All other routine was set by precept. Attentional behavior was reinforced; interfering behavior was ignored.

The work stations were completely set up when the children entered the classroom at 2 p.m. Margins were set at 20 and 85, line space was set for double spacing, two sheets of paper were inserted into the machine, the platen lever was all the way forward, paper guide was at zero, and practice material was in the copy holder at the right of the student.

Copy holders were developed for the material. A three-fourths inch aperture was cut in 9-by-12-inch manila mailers. A sheet of cardboard was placed in the mailer to stiffen it. Steno notebooks were used as stands in the standard college bookholders. These holders isolated single lines in the material. For children who could not keep their places on the single line, a frame was developed by one of the teachers which exposed one word at a time and could be moved down the line easily by the child. At the end of each day, the teacher marked the back of the manila mailer with information identifying the material, page and line on which the child was working. The primary researcher used this information to set up the work station the following day.

Games. Games were played, using the lighted keyboard chart, (see Appendix, page 43) to relax the children before break. Words were typed on the lighted keyboard. The children competed to see who could say the word first. The center aisle divided the room into two teams.

The side of the room getting the most firsts received punch first. The fiberglass boards for the Teacher's AID are removable and charts can be developed containing at least 40 items (4 rows times 10 diagonal columns). Mrs. McGraw placed 120 of the Dolch words on a fiberglass chart. Three words were placed on each lighted section. Masking tape strips covered two of the words. The masking tape was changed as the children completed practice on each of the sets. As the light flashed behind a word, the children typed the word and raised their hands on completion. A teacher checked the word and a child was a winner if he had the word correctly typed. Then all the children in unison called out the word. The children liked both these games.

There are numerous other possibilities for developing language skill using this programmable chart. Audio can be used in conjunction with the lighted board. A two-channel tape activates the board and carries the audio. Entire sentences can be played out word by word or letter by letter. The children could type with the board as the letter is backed up by the audio. Initial programs were taped for the group, but the spread of individual differences soon made it impossible to keep the entire group interested in the same practice. Earphones for individual students, leaving others free to work at their own pace, could bring the child language activities in two modes simultaneously, audio and visual. Plans are being made to develop materials of this kind, for small groups and for individual students.

Behavior Modification - Teacher Directions. The staff discussions following class were used by the staff to improve behavior modification techniques. Dr. Garris assisted staff members in understanding that

this phase of the project was primarily directed toward increased appropriate typing behaviors - and decreasing inappropriate typing behaviors by using praise, attention, and "pokies." "Pokies" - candy covered chocolates - were displayed in the rear of the room in a huge goldfish bowl. Eighty-five pounds of "pokies" were awarded during the program. Staff members worked at overcoming the tendency to take good behavior for granted and at reinforcing a child only when he behaved in a manner that contributed to his learning to type.

The staff members were asked to "catch the child producing good typing behavior" or "catch the child being good." Madsen's "Rules, Praise, and Ignoring: Elements of Elementary Classroom Control,"[1] was given to staff members to assist them in understanding "behavior mod" theory. Instructors gave praise, attention, or "pokies" only when the child was seated at the typewriter performing constructive typewriting activities. When a child stood up, turned in his chair, hit the typewriter keys, or fiddled with the levers or knobs of the machine, the instructor praised the child nearest him who was demonstrating constructive typing behavior. As soon as the interfering behavior ceased and the child demonstrated continued on-task behavior, at least 5 seconds of continuous attentional behavior, the instructor arrived to praise and otherwise reinforce him. This procedure of ignoring inappropriate behavior and reinforcing attentional behavior paid off almost immediately. The first day that the instructors concentrated their efforts according to the above instructions, the master switch was not needed. Previous to this time, when all else failed to attract the children's attention, the master switch was flicked off and all typewriters were powerless.

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[1]Charles H. Madsen, Jr., Wesley C. Becker, and Don R. Thomas, "Rules, Praise, and Ignoring: Elements of Elementary Classroom Control," JOURNAL OF APPLIED BEHAVIOR ANALYSIS, Volume 1, No. 2 (Summer 1968) pp. 139-150.

Video tapes were taken of baseline behavior - that which took place before concentrating on behavior modification - and of behavior obtained as a result of applying behavior mod procedures. Activity was considerably decreased, the noise level dropped, and production zoomed up.

Behavior Modification - Observations. Dr. Garris trained three observers to record student behavior as it related to the proximity of the teacher and to verbalization by the teacher.

"Interfering behavior" on the part of the student was defined as body and other movements; such as, getting out of his seat, standing up, sitting with his chair in the aisle, kneeling in his chair, swinging his arms, stretching, shuffling and sliding the chair back and forth, twisting his body in the chair, talking to another student or to himself, tapping the typewriter with one hand or one finger of either hand, hands inappropriately positioned (intentionally so positioned), hitting the typewriter, rolling the paper back and forth in the machine, moving the Selectric element back and forth in the machine by depressing the space or backspace (or moving the carriage on the SCM), or any other behavior that does not contribute to his improving his typing skill.

"Proximity" of the teacher was defined as the teacher's being within three feet of the child being observed. "Verbalization" by the teacher was defined as the teacher's directing some audible comment to the child being observed so that the observer could hear the sound and tell to whom the sound was directed.

"Attentional" or "on-task behavior" included all behaviors which are related to achieving typewritten copy; for example, looking at the teacher when directions are being given to a group or the entire class or an individual child, answering questions of the teacher, raising his hand and waiting for the teacher to respond, hands on the typewriter in

the appropriate position, looking at the paper in the typewriter, looking at the practice copy from which he is typing, and sitting in his seat in front of his machine. Generally speaking, task behavior is defined as orientation toward the appropriate object or person.

Behavior Modification - Training of Observers. Video taping of the class was made before the behavior modification training of the instructors took place. The playback of this tape was used in a simulated experience designed to teach the observers those observation techniques to be used throughout the study.

Behavior Modification - Attendance. To encourage attendance, which had to compete with many summer activities, each student was given his choice of a selection of candy bars, one for each five days' attendance. A star for attendance was placed on a chart by the child each day he attended.

Evaluation. The WRAT was administered individually the first day and again ten days later. The Dolch "Basic Sight Word Test" was administered three times on a weekly basis. The Slosson Oral Reading Test (SORT) was administered three times, again on a weekly basis. The Cooperative Primary Test - Reading was given at the end of the seventh week. The SPRD (Survey of Primary Reading Development) was administered the end of the eighth week. The major evaluation of this program is based on the SPRD because Azusa Unified School District reported May, 1971, scores on this test and will give another form of the same test in October, 1971. Results of the October testing will be furnished to the primary researcher for follow-up evaluation. The WRAT, Dolch and Slosson were used by the staff for evaluation while the program was in progress. Copies of test results were furnished each staff member with

the journal on the day following testing. A copy of the test result form used by the staff is included in the Appendix, page 50. Students' names have been blocked out; otherwise, this is the report attached to the journal of August 18, 1971. This reporting procedure was intended to keep the staff members apprised of the individual progress of each student.

RESULTS

Reading Results. Results of this project must be considered in the light of what could be expected of slow readers. What is normal progress for these children? Good tools for measuring what can be expected of a child are practically non-existent. Educators, in general, fall back on some combination of IQ and achievement test scores and subjective evaluations by the classroom teacher. No attempt is made here to modify standards for these children because their progress to date had been below the "norm." They have been exposed to school experiences for such a short period of time. It is sufficient merely to note that "difficulty in learning to read," as indicated by their classroom teacher, was the basis of a child's selection for the program.

The selection criterion given by the primary researcher to Azusa Unified School District was that no child be diagnosed as psychologically or medically handicapped. It was assumed that although these children were not making satisfactory progress in learning to read, all were capable of learning to read. Because IQ as a measure of ability for economically disadvantaged and culturally different children is questionable, no IQ data from any source are collected, used or referenced in this study.

The primary evaluation of reading improvement in this program was based on data from scores on the Survey of Primary Reading Development.[1]

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[1]J. Richard Harsh and Dorothy Soeberg, "Survey of Primary Reading Development," Berkeley, California: Educational Testing Service, 1965.

Prescores for tests administered in May, 1971, by classroom teachers in the Azusa Unified School District (Form 1-A) are compared with post-scores on Form B-1 of the same test (SPRD) administed by instructors in this research program on August 26, 1971 - one day before the end of the program. The mean grade-level reading improvement for the 15 children who completed the program was .96. General grade-level scores are based on 36 weeks of classroom instruction, for a full day, 5 days a week. This program lasted 8 weeks, 5 days a week, but for only 2 hours per day. Even if one does not consider the difference in exposure time per day in a regular classroom, one could expect 8/36 of a grade-level improvement, or .225. The difference of .735 between .225 (expected) and .961 (actual) is significant.

The uncontrolled variables must have had some impact. The low teacher-pupil ratio - at most, 1 to 6 - should have raised reading scores. The excitement of being a "college student" must have favored reading improvement. The almost inevitable Hawthorne effect of being in a special program was, no doubt, a favorable factor. Still, the effect of the negative variables must also be considered. The children were on the Cal Poly, Pomona, campus only 2 hours a day. At least 40 minutes of that time was spent in pre- and post-routine and break, as opposed to time spent actually typewriting. In several instances, family vacations took children out of the program for one to three weeks. Day excursions to Disneyland, picnics, swimming pools, etc., took their toll in class attendance. And, finally, mumps really clobbered attendance. One boy brought mumps in the third week of class; and for the rest of the program, someone was out with mumps most of the time.

Some time was spent in the pre-training meetings of the staff and during daily staff meetings to ensure that the children built a positive feeling for typewriting, for coming to the class, and for the program in general. There were many knowledgeable visitors from the college, the Teacher Education Preparation center and TEP classes, Pomona Unified School District, Azusa Unified School District, UCLA, and local colleges. Visitors always commented on the positive environment of the classroom. At times, however, the noise level at break was a little too much for some of the college classes in session in the Business Building.

Weekly evaluations on "quick and dirty" type reading tests were made throughout the program. There was no test available with a sufficient number of forms to use the same test throughout the program so that some objective comparisons could be made on weekly progress. The Wide Range Achievement Test (WRAT)[1] was administered first, followed by the Dolch Basic Sight Word Test[2] and the Slosson Oral Reading Test (SORT)[3]. On the following page is a chart detailing test results on the tests given the 25 children who participated in this program. Column 1, child's initials; column 2, grade attended in 1970-71; column 3, number of days attendance out of a possible 40; columns 4 and 5, WRAT results; columns 6, 7 and 8, Dolch results; columns 9, 10 and 11, Slosson results; column 12, pre-test, SPRD, given by Azusa classroom

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[1] J. F. Jastak et al, "Wide Range Achievement Test," Wilmington, Delaware: Guidance Associates, 1965.

[2] Edward W. Dolch, "The Basic Sight Word Test," Champaign, Illinois: Garrard Publishing Company, 1942.

[3] Richard L. Slosson, "Slosson Oral Reading Test (SORT)," East Aurora, N. Y.: Slosson Educational Publications, 1963.

R E A D I N G T E S T R E S U L T S

NAME	GRADE	ATTEN-DANCE	WRAT 7/2	WRAT 7/6	DOLCH 7/13	DOLCH 7/20	DOLCH 7/27	SLOSSON 8/2	SLOSSON 8/12	SLOSSON 8/17	AZUSA SPRD May '71	RAW/GRADE SPRD 8/26		GAIN
*H. A.	2	27	4.2	6.7	-0	-0	-0	5.5	6.5	---	2.6	83	3.9	1.3
L. C.	1	34	1.2	1.5	-24	--	-8	---	0.4	---	1.0	51	2.1	1.1
A. C.	2	38	3.5	3.9	-0	-0	-0	3.6	3.6	4.2	2.7	82	3.8	1.1
K. D.	1	9	1.4	---	-17	--	--	---	---	---	1.2	--	---	---
*T. D.	2	22	2.1	2.5	-1	-0	--	2.1	---	---	1.9	67	3.0	1.1
M. D.	1	38	1.5	1.5	-13	-4	-13	0.8	0.9	1.2	1.5	62	2.6	1.1
S. E.	1	24	1.2	1.2	-20	-21	--	---	---	0.1	1.0	51	2.1	1.1
M. F.	2	16	1.3	1.4	-13	-13	-18	---	0.2	---	1.4	--	---	---
E. H.	1	36	K-9	K-7	-19	-17	-13	0.1	0.2	0.4	1.5	46	1.8	.3
A. K.	1	35	K-4	K-2	-19	-15	--	0.2	---	0.6	1.0	61	2.6	1.6
M. L.	2	20	2.0	2.0	-1	-3	--	---	---	---	1.0	--	---	---
P. L.	2	39	4.4	4.2	-0	-0	-1	4.7	5.8	6.8	3.7	74	3.4	-.3
G. M.	2	8	1.5	1.5	-8	-10	--	---	---	---	1.7	--	---	---
D. M.	1	5	1.2	---	--	--	--	---	---	---	2.0	--	---	---
R. M.	1	14	.0	N-5	--	--	--	---	---	---	1.0	--	---	---
H. M.	2	31	3.1	3.1	-1	-0	--	3.4	3.9	4.5	3.5	78	3.6	1.1
S. N.	1	4	1.9	---	--	--	--	---	---	---	1.0	--	---	---
R. O.	1	11	1.9	1.9	-8	-5	--	---	---	---	1.0	--	---	---
R. P.	1	19	K-4	K-8	-24	-14	--	---	---	---	1.1	--	---	---
J. R.	2	35	2.1	2.1	-0	-0	--	---	2.0	3.3	2.1	71	3.2	1.1
L. R.	2	10	---	---	-16	--	--	0.1	---	---	1.0	--	---	---
M. R.	2	32	2.3	2.5	-2	-0	--	1.5	1.9	3.2	2.0	69	3.1	1.1
A. S.	1	22	K-5	---	-17	--	--	---	0.2	---	1.8	51	2.1	.3
R. S.	2	39	1.9	2.5	-9	-4	-1	1.0	1.2	1.9	2.3	65	2.8	.5
F. T.	2	39	2.9	2.8	-0	-0	-0	2.8	3.2	4.1	1.8	80	3.7	1.9
												MEAN GRADE-LEVEL GAIN		.96

*Test administered first week of school at
Azusa Unified School District

teacher in May, 1971; columns 13 and 14, SPRD results administered at the end of this program - raw score in column 13 and grade-level score in column 14; column 15 gives the grade-level gain of the child by comparing the pre- and post-program scores on the SPRD. Mean grade-level gain of .96 is given under the chart.

The SPRD will be given again in October, 1971, by classroom teachers in the Azusa Unified School District. The school district is going to furnish results to the primary researcher, and a comparison will be made to determine the holding power of the gains made in this program.

Two children were tested in their classrooms on their return to school in the fall. These children's names are marked with an asterisk on the chart. H. A. missed the final two weeks of the program because he was on vacation with his parents. T. D. missed the final three weeks and one day of the program because she went to stay with her grandmother. H. A. was making astounding progress on the weekly "quickie" test. He was also the best, fastest and most accurate typist in the class.

Anecdotal records for each child were kept on a daily basis by the staff. The program secretary posted test grades as they were administered on the right-hand side of the page (for sample form, see Appendix, page 51).

One child, A. K., learned to type at 19 words per minute with an average of only one error per minute - on a word level; i. e., the word and space that followed it - without being able to read the word. This is one of the most disturbing results of this program. The consultants, the primary researcher, and each of the instructors observed

this child at length. It seems almost impossible; but if she lost her place on the page, she could not return to it even though she was shown repeatedly how to follow the line of practice material with the index finger of one hand and the copy in her machine with the other hand. Her grade-level reading score showed improvement of 1.6, and the staff felt that she did learn many of the words on the Dolch list. This case is most unusual and still disturbs the primary researcher.

Even those children who did not know the letters of the alphabet gained from the class. Progress was much slower and much time was spent playing with the keys on the keyboard and comparing them, capital form, with the impression on the paper, lower-case form, caused by striking them. This is actually a very effective way of teaching the alphabet. There are rarely mirror-image forms (reversals); and when they occur, as b and d, the child gets feedback and referring to the capital form, which differs, usually makes his own correction.

The child never feels the frustration that he feels trying to learn to "write" the form. The results he gets are uniform, neat, and legible - they turn out to be exactly what he thought he ought to write. Spacing from left to right on the page is taken care of automatically. Return of the carriage spaces the material from the top of the page down. Spacing and perfectly written letters, which the typewriter takes care of so deftly, give the child a feeling of instant success.

Typewriting Results. Seven of the fifteen children who completed the program were typing 15 words per minute or more; two were typing 19 wpm. No overt timing took place. The primary researcher stood behind the child with a stopwatch hidden in her hand and timed the

child for one minute. The material and errors were then counted by the researcher. The child was aware that he was being watched and generally typed more slowly and more accurately. However, the children were never told what speed they had typed or even that they were being timed. This measurement was performed by the primary researcher only. Many years of orientation toward this tool, the timed writing, as a measurement of typewriting skill underlies this evaluation. The primary researcher wanted to deemphasize this aspect of the program with the other staff members and the children. All but three of the fifteen children who completed the program mastered touch operation of the letter (alphabet) keys. Two of these three children did not know the alphabet when they entered the class. At a slower pace, they covered all the letter keys of the alphabet and knew the upper and lower-case forms, but were not operating all keys automatically. The third of these children knew his alphabet but would work only when someone was standing with him. This one child, L. C., is a special problem and would be handled entirely differently in a program where some provision is made for handling the development of task behavior - for those children who need this training - before he is taught touch typewriting.

In the fifth week, some children were designated "drillers" and some "typists." This distinction was made on the basis of the kind of work the children were doing. Those children who were still completing the drill material for the presentation of the keyboard were designated "drillers." The children who had completed the practice material for presenting the keyboard and were typing stories were "typists."

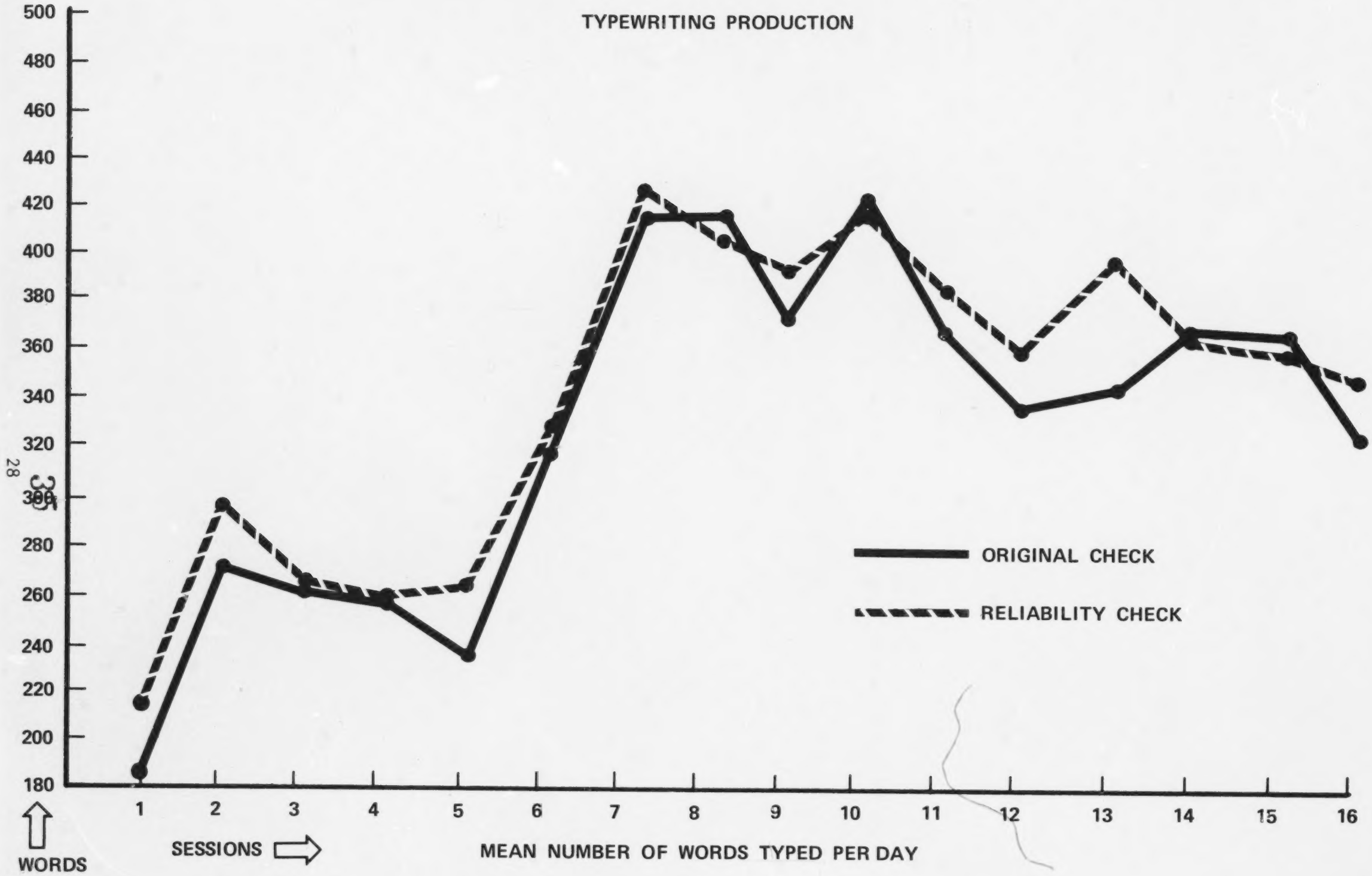
Production count of work typed each day was made for the final 16 days of the program. The children were reinforced for the work they produced. The "drillers" were given one "pokie" for each three practice patterns or words typed. A practice pattern was three strokes designed to present or practice a certain key reach. The three strokes may have been home-row key, reach, home-row key; e. g., ftf. Or, the pattern may have been a short word using the new reach; e. g., tag.

The "typists" were reinforced for "readable words," one "pokie" for each five "readable words." The definition for readable word is: "A readable word can be seen as a unit and may have transpositions, extraneous characters, and/or strikeovers; but from the context one should be able to identify the word; e. g., ɛenétre is "center" from: "in the ɛenétre of the room."

Charts on the next two pages illustrate and detail the production of the children during the final 16 days of the program. The original check was made by Mrs. Sandra Martins, Program Secretary, and the reliability check was made by the stenographers in the Cal Poly, Pomona, School of Business Administration steno pool, using the definitions listed above for drill pattern and readable word. The children filed their completed work - after having received their "pokie" payoff for this work - in their individual folders in the classroom. Mrs. Martins made the production count from these individual files.

The goal in this program was, in many respects, completely different from the goal in a vocational typewriting class. Many of the "taboos" of the vocational typewriting class were actually supportive of the goals in this program. The fact that a child was aware that he had made an error, that he could locate the error, backspace to that

TYPEWRITING PRODUCTION



T Y P E W R I T I N G P R O D U C T I O N

A comparison of
the Original and Reliability
Checks

Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Original Check Mean	185	269	264	260	233	318	416	419	369	425	362	330	339	376	373	324
Reliability Check Mean	216	298	268	264	268	333	435	410	392	419	389	362	403	373	368	355

point and place the correct letter over the incorrect one indicated real progress.

The children were allowed what Dr. Larry Erickson of UCLA calls "controlled looking." This means that the child could look at his hands, the keys, or the copy in his machine when he felt insecure. The children were aware that it was better procedure to be able to type without looking at the keys their fingers were striking. When the child was comfortable about a key reach, he made it by touch and without looking. All the children could touch typewrite without watching their hands throughout the program after a reasonable amount of practice. This was not a problem in this program. Never were the keys covered nor was a child harrassed about "not looking at his hands." The children were directed from the beginning to look at their hands as they placed them correctly on the keyboard. All of them placed their hands in position without looking after the program had been in session for a few weeks; but no emphasis was placed on this activity, and it happened as a result of practice and repetition.

Behavior Modification Results. Reinforcement was an integral part of this program. The children were rewarded with praise, attention, encouragement and "pokies" from the first day. Candy bars were given the children to encourage them to attend class.

During the fourth week, Ray Garris, behavior modification consultant, worked with the staff to structure behavior modification procedures and teaching methodology so that greater gains could be made in the use of the reinforcement.

Graduate students from Dr. Garris's classes were trained as observers. A copy of the observation form used by the observers to record

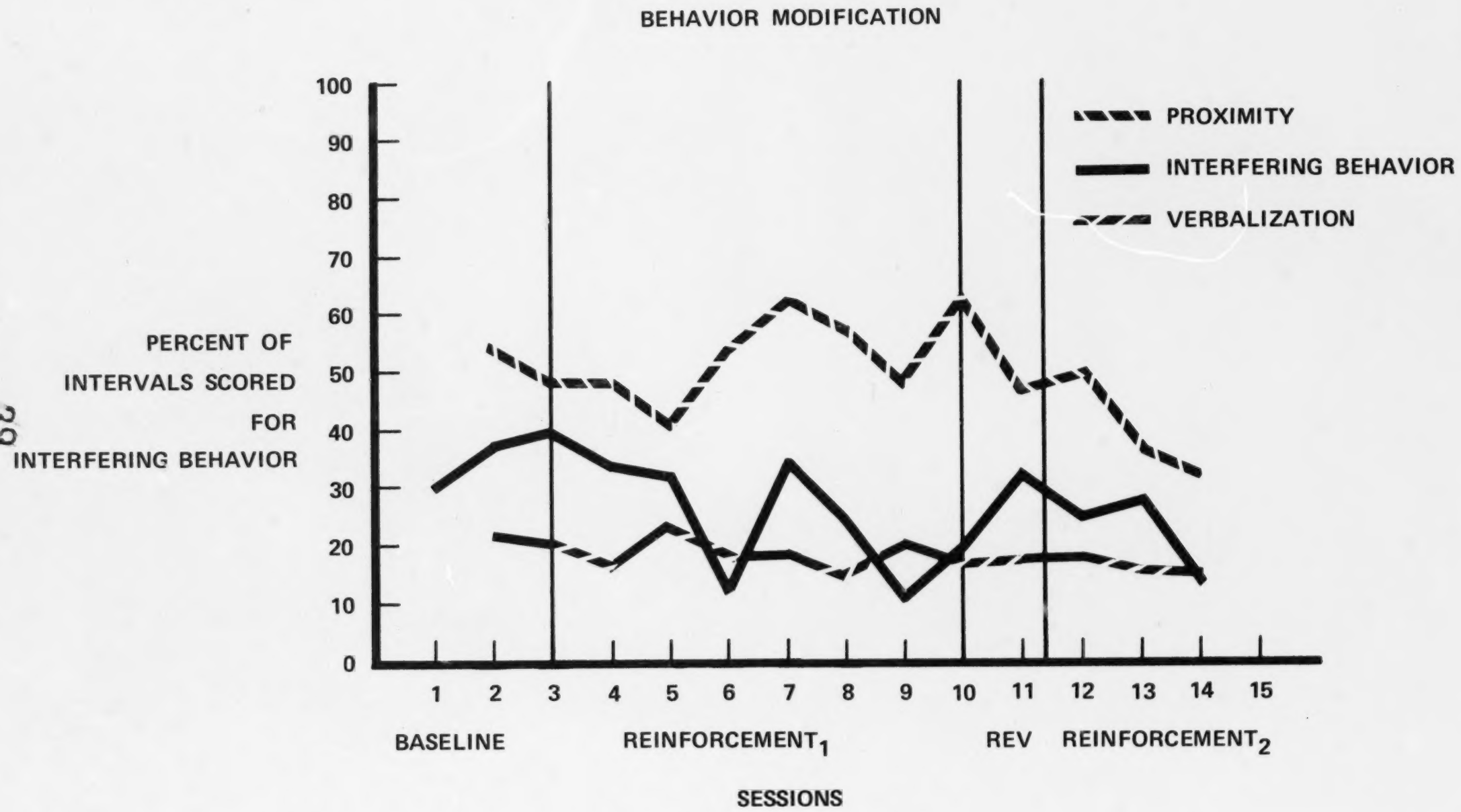
interfering behavior, teacher proximity and teacher verbalization is included in the Appendix, page 52. Video tapes were made of sessions during the fourth week. These tapes were used to simulate the classroom situation, and the observers were trained on this simulation.

The same video tapes were used by Dr. Garris to train the staff in effective behavior modification techniques. Definition of the terms and the techniques are given in the Methods and Procedures section of this paper, pages 15 through 18.

The Behavior Modification chart on the following page describes the results of the observations. The information on this chart was posted daily to a large chart on the blackboard in the back of the classroom. The results of the day's efforts were discussed each afternoon in the staff meeting that followed the two-hour instructional period. Day 1 is the baseline behavior. The observers recorded only interfering behavior that day. Task behavior is measured by the production of typed material accomplished by the children. The "Typewriting Word Production" chart on page 28 displays the production level as it relates to the "Behavior Modification" chart. On the second day of the structured classroom program of behavior modification, the observers recorded also teacher proximity and teacher verbalization.

Video tapes were made almost daily of the classroom activities. These were monitored by the staff during staff meetings, and there was a general discussion of progress and the areas in need of improvement.

From the first day of implementation of the structured behavior modification technique, the master switch was never used. Prior to


BEHAVIOR MODIFICATION
PROXIMITY
INTERFERING BEHAVIOR
VERBALIZATION
PERCENT OF INTERVALS SCORED FOR INTERFERING BEHAVIOR
100
90
80
70
60
50
40
30
20
10
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
BASELINE
REINFORCEMENT1
REV
REINFORCEMENT2
SESSIONS

this time the master switch was used, with some regularity, to shut off the machines and get the attention of the children. With the implementation of behavior modification, getting the attention of the children ceased to be a problem.

Publicity. Seeing very small children typing away by touch is fascinating. The doors to the classroom were generally left open, and this class had many impromptu observers.

The primary researcher discouraged any kind of news coverage of this activity until the program was almost completed. A former student, now a photographic feature writer with the SAN GABRIEL VALLEY TRIBUNE, stumbled on the program in the process of doing another story on the Cal Poly campus. Since she was from the Azusa area, she was permitted to take photos and do a story provided she play down the "reading" aspect. The children were never aware that they were chosen for the program because they were having difficulty learning to read.

The final week of the program the other newspapers that had contacted the college for a story were invited into the classroom. These reporters were cooperative in playing up the "touch typewriting" aspect and soft-pedaling the remedial reading.

Copies of news articles from the SAN GABRIEL VALLEY TRIBUNE, Sunday, August 15, 1971; the CLAREMONT COURIER, Wednesday, September 8, 1971; the POMONA PROGRESS BULLETIN, Sunday, August 29, 1971; and the campus newspaper, the POLY POST, Friday, October 8, 1971, are included in the Appendix, pages 53 through 61.

A 12-minute, 16 mm, color movie was made of the program on Thursday, August 19, 1971. This movie is in the finishing process. Introductory

frames identifying the program and the personnel and giving the "where" and the "how funded" details are being developed and placed at the beginning of the film. The movie is scheduled for use on the Cal Poly, Pomona, campus and at local school districts. The primary researcher is scheduled to make a report of this research program at the California Business Education Association State Convention at the International Hotel, Los Angeles, on Monday, March 27, 1972, at 9:30 a.m. Five of the video tapes were saved and are available for review.

CONCLUSIONS

The results of this research program indicate that slow and even non-readers can be taught reading skills as a by-product of learning touch typing.

The original purposes as stated in the proposal for this research program were:

1. To investigate the amount of reading improvement that takes place as a child learns touch typewriting.
2. To develop linguistic comprehension in Standard English as a by-product of the practice material used in keyboard presentation and fixation of automatic stroking.
3. To produce introductory reading materials which promote phonic understanding as they fix typing-key strokes and reaches.
4. To use pattern practice and key-stroking exercises to develop finger dexterity and rhythm.

The mean class gain of .96 of a grade level on the Survey of Primary Reading Development indicates that a significant amount of reading improvement takes place as a child learns touch typewriting.

The results on the "quick and dirty" word comprehension tests, the WRAT, DOLCH, and SORT show progress on the part of the children in vocabulary development and linguistic comprehension in Standard English. (See Chart, page 23).

No direct measure was made of the amount of phonic understanding developed in the process of associating the letters of the alphabet

and the typewriter keyboard, but even those children who entered the program with little knowledge of their alphabet mastered the letters of the entire alphabet and the correct phonic associations.

Most of the children entering the program had some difficulty in getting their fingers to operate individually. One child asked, "Why is it that when I push "s", I get "a," too?" By the end of the first week, some children had developed good finger dexterity in even the ring finger and the "pinkie." By the end of the sixth week, none of the children had difficulty operating all fingers independently.

Some unanticipated results of the program are worthy of mention. Boys, more often than girls, seem to have difficulty learning to read. This was borne out by the fact that Azusa schools chose 17 boys and only 8 girls for this program. Machines, and particularly motorized, electric machines, seem to be more interesting to boys than to girls. The boys in the program never completely satisfied their curiosity about how the typewriters worked and what all the gadgets and levers were. The girls, after about a week, concentrated their interest on the parts of the machine that accomplished the task they were trying to perform. Touch typewriting is able to capitalize on this natural male interest in things mechanical to expose the child for long periods of time to linguistic concepts.

All observers were amazed at the extended length of time a 7- or 8-year-old child could concentrate while working at the typewriter. Limited attention span was no problem in this program.

Almost all of these children, on entering the program, were frustrated when trying to write their names manually. All the standard

reversals appeared: b and d, p and q, u and n. There was some phonic interference; e. g., c and s. Many of the children wrote from right to left; and almost all of them had difficulty with proportions. Using the typewriter, they got a perfect letter every time. The typewriter always wrote from left to right and from top to bottom. If a child did reverse a letter, he usually became aware of it; and, using the capital form, which differs in a way that makes the reversal more obvious, he would correct the form. For these children, this was "instant writing success."

Perhaps the most rewarding, unexpected result - for the primary researcher, that is - was the interest which developed on the Cal Poly, Pomona, campus in a number of areas. Mrs. McGraw, the reading consultant and one of the instructors, brought her college classes in for observation. Dr. Garris visited informally and became deeply involved in smoothing and polishing the behavior modification procedures. Teachers and school administrators from the surrounding area visited the class and showed a great deal of interest.

Summary. This research indicates that teaching first- and second-grade slow readers to type by touch is an effective vehicle for improving reading skills.

RECOMMENDATIONS

School districts should consider the use of their electric typewriting laboratories for improving the reading skills of primary children who are having difficulty learning to read.

Teaching touch typewriting can be used as a reinforcing activity for primary children. The primary researcher and the behavior modification consultant are developing a program for working with slow readers that incorporates more direct approaches to reading improvement and uses touch typing instruction as a reinforcer.

Packaged cassette programs using the Teacher's AID (see Appendix, page 43) could be used for individual instruction and also for working with small groups using the electric typewriter.

Only electric typewriters should be used with primary children because they haven't the finger dexterity or strength to work with manual machines. The IBM Selectric typewriter is the most effective instrument because it has no keys to clash and seems better able to withstand the harder use given it by primary children.

Primary children need special materials for presenting the keyboard. Capitalization (use of the shift keys) should be delayed until all letter reaches have been mastered. The practice material from which children work should be typed with a primary typewriter and double spaced.

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APPENDIX

ff jj ff jj ff jj fj fj fj dd kk dd kk dd kk dk dk dk fj

ss ll ss ll ss ll sl sl sl aa ;; aa ;; a; a; a; fj dk sl

a; sl dk fj a; sl dk fj a; sl dk fj a;sldkfj a;sldkfj

asdf ;lkj asdf ;lkj asdf ;lkj a;sldkfj a;sldkfj a;sldkfj

lad fad lad fad lad fad sad sad lad fad sad lad fad

hj hj hj had had had; sad lad had a fad; sad lad had a fad;

ik ik ik jhj kik jhj kik jhj kik; a lad is sad; a lad is sad;

aa ;; ss ll dd kk ff jj hh ii a; sl dk fj hi; hi sad lad;

a;sldkfj a;sldkfj hi a;sldkfj a;sldkfj hi; a lad is sad;

dad is sad; a dad had a lad; a lad is sad; sad dad; sad lad;

aa ;; ss ll dd kk ff jj hh ii a; sl dk fj hi; hi sad dad;

THE TEACHER'S A.I.D.

Multi-Media Approach to Typing and Shorthand

--Preprogrammed lessons of synchronized sight and sound
--Instructor free for individual observation and assistance
--Rapid acquisition of basic skills
--Greater proficiency in use of basic skills

The multi-media approach to typing offers unparalleled benefits in rapid acquisition of basic skills and maximum personal achievement for each student. One of the primary aims of this approach is to create an atmosphere in which the instructor is free to provide the kind of individualized teaching which is so effective in motivating, explaining, and directing each student to achieve his full potential. With the class responding to a carefully prepared multi-media program, the instructor will have the time in which to offer individual instruction and assistance as well as to observe each student individually.

In the present classroom situation, the instructor must direct the presentation of material at a pace which fails to satisfy the needs of many students. Using the multi-media approach, the pace can be increased since the instructor is free to help students who are having difficulty.

During beginning typing and beginning shorthand, the Teacher's A.I.D. electronically synchronizes a visual presentation of typewriter keys or shorthand outlines with a tape-recorded lesson.

In the beginning typing class, the Teacher's A.I.D. illuminates symbols on a display sheet arranged to simulate a large typewriter keyboard. The lessons to be presented cover the home row, all characters on the keyboard as well as reach combinations, simple words or sentences, and drills on the carriage return, use of the space bar, and so forth.

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P. O. Box 594
Claremont, CA 91711

In shorthand classes, the sheet with the typewriter symbols will be replaced by a different display sheet to present theory or brief forms. The outlines to be mastered will be flashed in synchronism with the pre-recorded dictation. As dictation becomes more important, the students have the immediate reference for outlines with which they are having difficulty. No longer will they have to search the chalkboard for an outline, only to give up because they are so far behind the dictator.

As individual students gain sufficient proficiency in basic skills, they begin an individual instruction program employing individual tape recorders and earphones. Individualized pre-programmed material allows each student to proceed at a rate which allows him to achieve his maximum effectiveness.

The Teacher's A.I.D. can be used with slower students without interfering with students involved in individual instruction programs. In addition, the Teacher's A.I.D. can be used for automatic daily warmup, make-up work (late entrants or absentees), review, and remedial work.

OPERATIONAL DESCRIPTION

Three-inch symbols are arranged on a translucent plastic display sheet to simulate the typewriter keyboard. The display sheets are replaceable so that any symbol groups for subjects such as typing, shorthand, business machines, chemistry, etc., may be presented.

Ready-made display sheets can be provided or they can be made by using a blank sheet and a grease pencil (erasable) or a felt pen (permanent). Symbols can be made invisible until illuminated by inserting a specially treated plastic sheet in front of the display sheet.

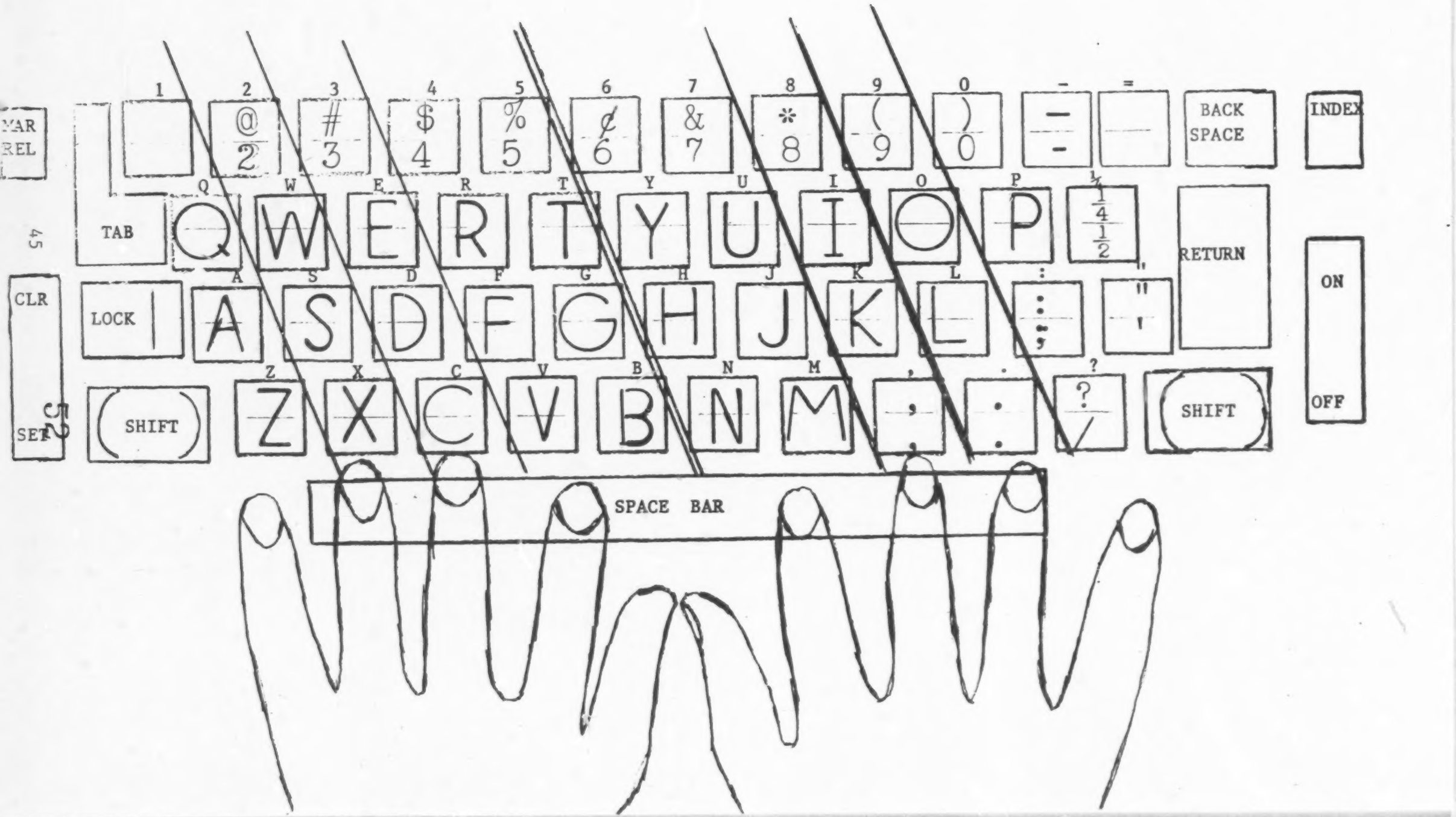
Symbols are illuminated from behind one at a time in any desired sequence and at any rate by control signals from a tape recorder (the shift key symbol can be illuminated concurrently with any other symbol). Symbols can also be illuminated manually with a pushbutton box during the classroom presentation.

Up to one hour of sight and sound can be recorded on a single side of a stereo cassette tape. During the classroom presentation, the tape recorder is plugged into the Teacher's A.I.D. All that remains to be done to present the pre-programmed lesson is to turn on the tape recorder.

PROGRAMMING

Any instructor can program a tape on the first try by preparing a script and by following a few simple instructions during the recording session. The sound and illumination control tracks are recorded concurrently using a microphone and a pushbutton encoder box.

Recording multi-media programs takes no longer than the time required to play back the tape in the classroom presentation.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NEW READING SKILL BUILDER
Grade Level II, Part 1, Story 3

My dog, Hero, isn't afraid of most things. He isn't afraid of cars or cats. He isn't afraid of dogs bigger than he is. But he <u>is</u> afraid of one thing. The vacuum cleaner!

Every Saturday morning, Mother cleans the house. First she runs the cleaner in the living room. Hero hides under my bed. Then she cleans my room. Hero hides in the kitchen.

We always laugh at Hero. "Why are you afraid?" we ask. "The vacuum cleaner can't hurt you."

But sometimes I am afraid of things, too. I am afraid to be alone in the dark. And I <u>know</u> the dark can't hurt me.

I guess it's the same way with Hero. He is afraid without

knowing why.

A few weeks ago, Mom brought my new baby sister home. Her name is Barbie. She has a room all her own. Hero seems to know it is hers.

Last Saturday, Mom was cleaning the house again. Barbie was sleeping in her room. Hero was in the living room.

47

Mom began to run the cleaner in the living room. Hero jumped out from under a chair. He ran toward my room. But then he stopped. He sat down at Barbie's door.

54

Mom went on running the cleaner. She ran it closer and closer to Hero. But Hero didn't move!

"You can't take the cleaner into Barbie's room," he seemed to say. "I am taking care of Barbie."

Mom says that Hero has the right name. He is a real hero. He is brave.

Being brave is not the same as not being afraid, Mom says. Being brave means that you do what you have to do. You do it even if you are afraid.

Hero knew what he had to do. He had to take care of Barbie. So he did.

Lizards are great bluffers. They can get themselves out of danger in many different ways. One lizard leaves its tail behind when something takes hold of it. Another can also blow itself up, so that it looks three times as big as it is.

The most surprising thing about these animals is the way different kinds of lizards move about. Some have legs; some have not. Some seem to find it easy to walk upside-down on a ceiling or to hold onto glass. Some kinds can stand straight up and run on their two back feet.

There are even lizards that can swim. Others can almost fly. They jump from tree to tree. We call these lizards "flying dragons."

			7/2	7/6		7/13	7/20	7/27		8/2	8/12	8/17
	2		4.2	6.7		-0	-0	-0		5.5	6.5	---
	1		1.2	1.5		-24	--	-8		---	0.4	---
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	1		K-4	K-8		-24	-14	--		---	---	---
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	2		2.3	2.5		-2	-0	--		1.5	1.9	3.2

*That's all I want to read."

Page No._____

NAME _____

Week/Day	Comments

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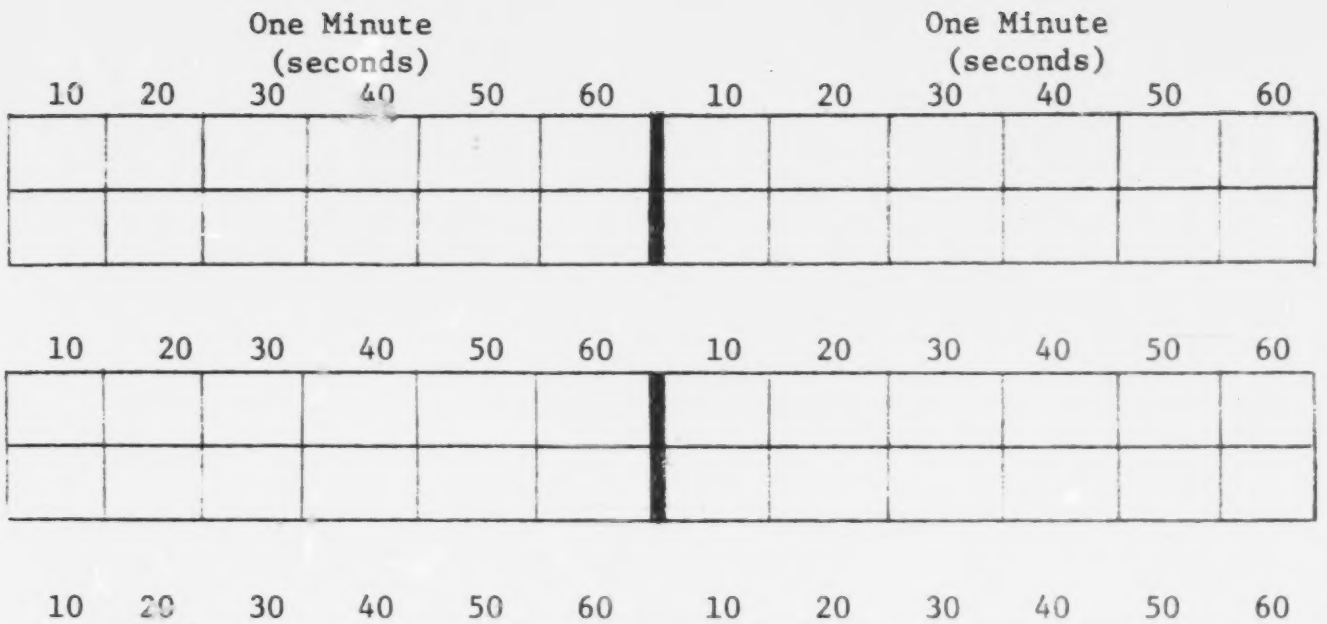
	SPRD
Pre 8th Wk.	

OBSERVATION FORM



Row 1 S = Interfering Behavior
N = Task Behavior

Row 2 V = Teacher Verbalizations
/ = Teacher Proximity (3 feet)

San Gabriel Valley TRIBUNE

Family LIVING

ELAINE HOFFMAN, Editor

SECTION D, PAGE 1 SUNDAY, AUGUST 15, 1971

Azusa Tots Go to College

By DANA DOWNIE

"It's fun! I like it," bubbles one enthusiastic seven-year-old.

"I like to look at it," admitted one boy as he admired the imposing machine in front of him.

"Everything is so much bigger," giggled an eight-year-old girl, as she wallowed in the "oversized" chair and desk.

"I like the candy," smirked one crew cut boy.

Seven and eight year old Azusa youngsters are learning to type without looking at the keys in an experimental program at Cal Poly, Pomona.

Selected by the Azusa School District, the children are taken by bus to the daily two hour class which is scheduled for eight weeks. Heading the program is Mrs. Eric Seibert, Associate Professor of Business, assisted by Liz Anderson, Jane McGraw, Lois Wood, and two student assistants.

Mrs. Seibert, applying her own observations of her children and their friends who learned to type, said the main object of the program is to see if children this young are able to learn touch typing.

Knowing the letters on the typewriter is aided by color coding. Each fingernail for the home row letters is painted a color that corresponds with a colored keyboard

TYPEWRITING TOTS—Mrs. Eric Seibert, sho that youngsters are fascinated by typing c the wonderment of it all are Richard Mas from left, Peter Lugo, Frank Tomlinson and

to Learn Touch Typing

chart. This technique was not needed long, according to Mrs. McGraw, for soon the children were learning "reaches" to letters above and below the home row keys.

The typing program requires one essential ingredient: an electric typewriter. "Electric typewriters are used because these young children do not have the muscle co-ordination and strength required for a manual typewriter," she stressed.

According to Mrs. Seibert, typing increases the dexterity of the fingers as well as increasing their strength. This improved dexterity allows the child to more easily manipulate a pencil, thus helping his handwriting.

Additional benefits are improvement in reading skills and vocabulary through devices such as a special lighted keyboard chart in the front of the room and the writing of letters.

Letters are written to Mrs. Seibert, parents, friends and especially to the bus driver, a very popular person with the youngsters. One letter plead's, "please pick us up earlier so I can come to school sooner." Other letters also show their liking for the class, teachers and Cal Poly: "I love Cal Poly. I want to come here more. ...I love the class. I love Quickdraw (Mrs.

(Continued on Page D-3)

Tribune Photo by Dana Downie

wn above with Annette Curiel, discovered lass she instructs at Cal Poly. Expressing n, left; Louie Cisneros, right; and below Ralph Ponce.

Typing Tots Like College

(Continued from Page D-1)

McGraw)". The letters are handwritten, retyped by the staff with corrections, and returned to the child who retypes it. Mrs. Seibert states that the children are too young to compose letters directly on the typewriter.

"I did that?" — grins a small, dark haired boy as he gazes on his typewritten masterpiece. "The children have great feelings of pride in being able to type," smiles Mrs. Seibert.

An extra incentive are the small chocolate candies used as a reward. The child's work is appraised and then awarded the appropriate candy earnings in a plastic bag—an added treat for the ride home.

The therapeutic typewriters

Tempting the sweet tooth and teaching touch typewriting are devices used to improve the reading abilities of post-Headstart children who will be in the second and third grades this fall.

Brightly colored M&M's melt in the hands of these youngsters who are part of an experimental program held at California State Polytechnic College, Pomona. Mrs. Kay Seibert, associate professor of business at the college, developed the idea of teaching children to read through typing at the suggestion of an employe of IBM who had supplied her with some typewriters for her college courses. The theory is that by familiarizing the pupils with letters,

words and sentence structure as they typed stories, their reading abilities would improve.

She began the experiment last summer, teaching her own children and their friends to type "just as a game for myself". Most of her associates were quite skeptical of the project at the time but were impressed at the end of the summer when the children, ranging from kindergarten to junior high school age, had learned to type.

Because of her success last summer, Mrs. Seibert applied to the US Office of Education for a grant to administer the program to underprivileged (Title I) children who had been in Headstart. The project was developed further to include

CONTINUED

Typewriters continued

students from the teacher-preparation program at Cal Poly.

Under the direction of Raymond Garris, a professor in the Cal Poly program, students evaluated the progress of the

children over the 8-week period. They compiled charts which recorded the children's classroom behavior in relation to the teachers' proximity and verbalization.

The children, all residents of Azusa, were bussed in Monday through Friday afternoons. Seated on typing chairs, usually elevated by packages of paper (rather than telephone books), the young typists worked for two hours. They were given stories according to their individual reading levels and were asked to type them. The children were rewarded with one M&M per typed line; the candies were distributed at 4 p.m. as they were leaving.

Candy also was given for attendance. Beginning the session with 26 pupils, the class narrowed to 18 by the end of the term, with approximately 13 regulars. Gold stars were awarded for each day that a child came to class and a red star was given after 5 days of attendance. A candy bar or package of gum was distributed to each child who had earned a red star. After 23 years of teaching experience, Mrs. Seibert believes that there are very few students who learn simply for the love of learning. For that reason, she feels that "M&M's don't hurt," and that rewards are helpful to the educational process. Her theoretical foes would argue that the system of rewards attempts to solve one problem by creating another (i.e., some kind of exterior reward may always be expected in the future for any kind of accomplishment).

Typewriters

THE SUCCESS of the program does, however, appear to be significant. Youngsters, who didn't know their alphabets at the beginning of the summer, are now typing stories. One little boy took home 280 M&M's in one day. He now has 620 hoarded at home.

The children type on electric machines because they don't have the muscle coordination and strength for manual typewriters. Only two of the original 26 pupils have typewriters at home. In addition to improving the reading skills of the youngsters, typing increases the strength and dexterity of their fingers, aiding in the grasp of writing utensils and, ultimately, the improvment of their handwriting.

The activities of the typists are recorded on video-tape each day. Because the children were not informed as to the purpose of the course, they have not yet seen the films. The films will be used by the teachers to determine the behavior problems of the students, as well as mistakes in hand placements and other skill-related difficulties that might arise.

THE SCHEDULE of the session allows for typing the first hour, a break at 3 p.m. for games and punch, and then a return to typing or testing. Pupils are given tests each week to record their progress in reading skills. Another advantage of using the typewriter is that all of the letters are perfectly formed and are never turned backwards, a common occurrence in children's handwriting.

Teachers concentrate on typing primarily and rarely deal with behavior difficulties. They walk around the room praising the children for good work and ignoring interference behavior. The theory is known as positive reenforcement. It is sometimes difficult, however, for the teachers to restrain themselves from dragging a wandering child back to his seat.

The teachers include Jane McGraw (nick-named Quickdraw by the children), an instructor in the teacher-preparation program at Cal Poly; Rick Sylvester, a high school teacher in Fontana who worked with a similar touch-typewriting-for-improved-reading program at Mt. View Elementary School last year; Liz Anderson, a junior high school teacher in Azusa, and teacher aide, Steve Smith, a student at Cal Poly. Lois Wood, a Title I teacher in the Pomona Unified School District, worked on the project during part of the summer.

Mrs. Seibert, who will use the results of the experiment in her doctoral dissertation from UCLA, hopes to continue the project next summer using children from the Pomona area.

A Claremont resident, who lives at 3217 N. Towne Ave., with her husband, Eric, retired from the Navy and now working as a chiropractor in Chino. They have two sons, Bill, 11, and Dave, 7, students at Foothill Country Day School, and a daughter, Jan, 9, who attends Mt. View Elementary School.

—Ellis Waingrow

Typewriter contin

1st and 2nd Graders 'Attend' Cal Poly

POMONA — First and second graders in college?

It's happening this summer at Cal Poly as youngsters from Azusa study touch-typing under a U.S. Office of Education grant.

The students, especially selected by the district for the program, are bused to the college, where they work at their typewriters from 2 to 4 p.m.

A four-teacher team headed by Mrs. Katherine Seibert, associate professor of business administration and assisted by Dr. Raymond Garris of the college's teacher preparation center, conducts the class. Other instructors are Mrs. Jane McGraw of Cal Poly, Elizabeth Anderson of the Azusa district, and Mrs. Lois Wood of Pomona schools.

Touch-typing skills may be the course's primary purpose, officials say, but improved reading skills and vocabular and increased finger dexterity are additional benefits the youngsters are gaining.

POMONA PROGRESS BULLETIN

August 29, 1971

Program successful

BY CHRIS HARRIMAN

First and second graders learned to touch type and improved reading skills this summer as an experimental eight week program at Cal Poly proved to be a big success.

Underprivileged (Title I) children from Azusa, attending class from 2 to 4 p.m. five days a week during July and August, were given instruction on Selectric typewriters.

Mrs. Eric Seibert, associate professor of business and head of the program emphasized, "As far as I can tell, there is no other research program like it anywhere."

The children were never aware this program was for reading. It was assumed they were having difficulty learning to read and had been turned off by most standard approaches to learning to read.

The class began with 26 students and narrowed to 18 with 13 in regular attendance.

Under the direction of Raymond Garris, instructor in Teacher Preparation at Cal Poly, students evaluated the progress of the children over the eight week period.

The mean grade level improvement in reading was .953. Youngsters who didn't know the alphabet at the beginning of the summer were are now typing stories.

The main objective of the program, according to Mrs. Seibert, was to see if children this young are able to learn touch typing. Additional success was the improvement in reading skills and vocabulary. The children's finger dexterity was increased, as well, allowing them to more easily handle a pencil and improve handwriting.

"Electric typewriters were used because the young children didn't have the muscle coordination and strength required for a manual typewriter," stated Mrs. Jane McGraw, instructor in Teacher Preparation at Cal Poly and a teacher for the program.

Typing the letters was aided by color coding. Each fingernail for the home row letters was painted a color that corresponded with a colored keyboard chart. "This technique was not needed long," said Mrs. McGraw, "soon the pupils were learning 'reaches' to letters above and below the home row keys."

The youngsters were rewarded with an M & M candy for each typed line. These were distributed at 4 p.m. as they were leaving, an extra treat for the bus ride home. Youngsters were also given candy and gum for regular attendance.

The children wrote letters to Mrs. Seibert, parents, friends, and especially the bus driver. One read: "Please pick us up earlier so I can come to school sooner." Other letters displayed liking for class, teachers, and Cal Poly.

The letters were handwritten, retyped by staff with corrections, and returned to the child who retyped it. Mrs. Seibert said, "The children are too young to compose letters directly on the typewriter."

She added, "The children have great feeling of pride in being able to type."

Mrs. Seibert developed t dea of teaching children to read through typing at the suggestion of an I.B.M. employee. The

theory is that familiarizing the pupils with letters, words, and sentence structure as they typed stories, their reading ability would improve.

Teachers in addition to Mrs. Seibert and Mrs. McGraw were Elizabeth Anderson, 6th grade teacher for the Azusa Unified School District; and Lois Wood, primary Consultant and teacher for Pomona Unified School District.

Cal Poly students helping included Steve Smith, teacher assistant; and Sandy Martins, secretary and assistant.

The "applied behavior modification" method was used in dealing with behavior difficulties. Teachers praised good work and ignored interference behavior.

Because of the success of the program, Garris and Mrs. Seibert are applying to the U.S. Office of Education for a grant to repeat the course next summer with 30 under privileged Pomona children.

TINY TYPISTS were among 26 first and second graders attending college this summer. Photos courtesy of the **CLAREMONT COURIER**